iPanel: A Computer-Vision Based Solution for Interactive Keyboard and Mouse

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Abstract. This paper represents an implementation of a computer vision based interface; iPanel which employs an arbitrary panel and tip pointers as a spontaneous, wireless and mobility device. Also the proposed system can accurately identify the tip movements of the panel and simulate the relevant events on the target environment. By detecting the key pressing, mouse clicking and dragging actions, the system can fulfill many tasks. Therefore, it enables users to use their fingers naturally to interact with any application as well as with any mobility enabled devices.

Keywords: Computer vision, Human computer interaction, gesture recognition, optical character recognition, wearable computing.

1 Introduction

Human computer interaction is the technique of studding the relations between people and computer or computer mediated information. Thus it involves the design, development and evaluation of models, systems and applications from a human-centered perspective. Since its inception in the 1980s, HCI has been primarily concerned with designing more usable computer systems, attractive conventional computing devices, be it the computer desktop, the Web, or the mobile phone. It evaluates the existing designs and shows how to improve them. And, it attempts to apply its methods to design more user friendly systems from the start. Human-computer interaction comprise many sub domains such as gesture reconstruction, event detection, video tracking, object recognition, learning, indexing, motion estimation, and image restoration. Each sub domain is a unique concept of computer vision and it attempt to address a particular area of HCI, where the computers are pre-programmed to solve tasks or the interactions (e.g. touch screens, tablet PCs).

It has been identified and observed that many researches are adopting gesture reconstruction and ended up with implementing excellent results (e.g. Microsoft is researching on how user can interact with computers or computational devices in more efficient and user friendly manner [7]. Thus gesture recognition, sensor based

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